Temperature Alignment

X Degree Compatibility

The X-Degree Compatibility Model

The X-Degree Compatibility (XDC) Model, developed by right. based on science, calculates the contribution of a company, portfolio or any other economic entity to climate change, answering the question: How much global warming could we expect, if the entire world operated at the same economic emission intensity as the entity in question until 2050 under a specific scenario? Results are expressed in a tangible degree Celsius (°C) number: the XDC.

These are mapped against a sector-specific temperature benchmark (Target XDC) based on mitigation scenarios of the International Energy Agency (IEA)*.

How it works

X-Degree Compatibility is calculated in four steps[1]:

1. **Question:** How many emissions (CO2e) are generated every year until 2050, to create EUR 1 million in gross value added (GVA)? → **Result:** Economic Emission Intensity tCO2e / million EUR
2. **Question:** How many emissions (CO2e) would be generated if the whole world operated at the same emissions intensity until 2050? → **Result:** Global Emissions tCO2e
3. **Question:** What degree of global warming could we expect if this amount of emissions reaches the atmosphere? → **Result:** Baseline XDC x°C
4. **Question:** What is the difference between the Baseline XDC and the sector-specific Target XDC*? → **Result:** XDC Gap ±x°C

XDC Gaps ≤0 indicate that the entity is aligned with the chosen global warming scenario, while XDC Gaps >0 indicate misalignment.

The XDC Model is science-based, peer-reviewed, forward-looking, TCFD-compatible, aligned with the EU Green Deal, transparent and will be published as an Open Source application in 2021 (currently accessible for academia). It is also the only methodology of its kind to integrate a full climate model (the FaIR Model[2] also used by the UN Intergovernmental Panel on Climate Change (IPCC)).

* The International Energy Agency (IEA) allocates the remaining emissions budget to stay below e. g. 2°C (2DS) or 1.75°C (B2DS) global warming between sectors, taking into consideration their inherent differences in emissions intensity and cost-optimised capacity to reduce emissions. The XDC Model 'translates' this allocation into °C values, yielding sector-specific **Target XDC**s.

1. For a detailed and peer-reviewed description of the XDC Model and methodology, see: Helmke, H. et al. (2020). Provision of Climate Services—The XDC Model. In: Filho, W. L. / Jacob, D. Handbook of Climate Services. Springer, Cham. Retrieved from https://doi.org/10.1007/978-3-030-36875-3

2. Smith, C. J. et al. (2018). FAIR v1.3: a simple emis-sions-based impulse response and carbon cycle model. Geosci. Model Dev., 11. pp.2273–2297. Retrieved from https://doi.org/10.5194/gmd-11-2273-2018 . And: Millar et al. (2017). FaIR. Retrieved from https://fair.readthedocs.io/en/latest/intro.html

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Input & Output

Input Data

GVA

EBITDA, Personnel Costs

FactSet Research Systems

CO_2e emissions

Scope 1, Scope 2, Scope 3

Urgentem

Components

Also used by **IPCC**

Mitigation, macro- & socio-economic scenarios and data

IIASA, IEA, World Bank...

Climate model

FaIR

University of Oxford, University of Melbourne

Degree Compatibility

X°C Baseline XDC

Degree of global warming the **entity** is currently* compatible with.

X°C Target XDC

Sector-specific target temperature to align with the <2°C scenario.

X°C Sector XDC

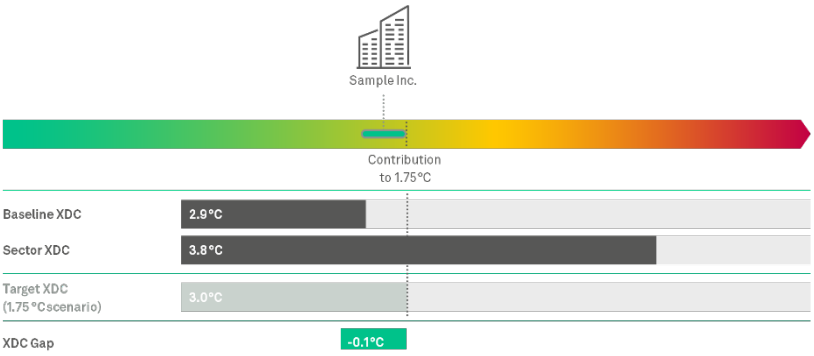
Degree of global warming the **sector median** is currently* compatible with.

± X°C XDC Gap

Indication of **alignment/ misalignment** with the <2°C scenario

*Under Baseline assumptions, which represent the continuation of historic trends until 2050.

Results at company level



The company in this example has a Baseline XDC of 2.9°C.

The sector median is at 3.8°C (Sector XDC).

To be compatible with a total global warming of 1.75°C (according to the IEA's B2DS scenario), the company would have to comply with a limit of 3.0°C or less (Target XDC).

This means that the company is -0.1°C below the limit of 1.75°C compatibility in the 'as is' or baseline scenario. It is compatible with the goal of the Paris Climate Agreement ('Paris-aligned').

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